

TE10A

**SINGLE PHASE
POWER CONTROLLER
BURST FIRING and
PHASE ANGLE OPERATION**



TE10A
Product
data

TE10A Single phase power controller

Multiple applications—The TE10A is a single phase power controller with DC input that is designed for general purpose single phase applications where resistive, inductive, temperature dependent or infrared loads are involved. Typical applications include automotive industry (paint drying), food processing (cooking, browning), environmental temperature control, heat treating, plastics (extrusion, thermoforming) and textiles (drying, coating, printing).

Ergonomic design—The TE10A is easily integrated into a control system because of its compact size, simplicity of wiring and DIN rail mounting. This design allows a significant reduction in cabinet size and lowers maintenance costs.

High performance—The TE10A performs with a control precision of $\pm 2\%$ of maximum voltage and a linearity of better than $\pm 2\%$ of full scale. Automatic compensation for supply fluctuations enables constant output power to be maintained for constant load, despite variations in supply voltage.

Flexibility—The TE10A has, in addition to the standard burst, single cycle and phase angle firing modes, an advanced single cycle firing mode suitable for short wave infrared loads. The TE10A is controlled by an external analog signal which is selectable for DC current or voltage. Alternately, an internally provided 5V user voltage allows local control by a potentiometer. A plug-in signal connector avoids any risk of wiring error if the unit has to be replaced. The TE10A can be used with a range of standard single phase voltages but it can also be used to control non-standard voltages by using an optional auxiliary supply (115V, 230V). The TE10A may be mounted in a panel cut-out or DIN rail mounted or bulkhead mounted inside a cabinet.

Toughness / Reliability—TE10A SCR's can withstand momentary overcurrents up to 15 times the nominal rating. This is important when controlling short-wave infrared elements. The SCR breakdown voltage is three times greater than the nominal operating voltage. Current derating curves as a function of ambient temperature enable TE10A units to be used up to $+60^{\circ}\text{C}$.

CE Marking / Safety—TE10A units meet the essential requirements of the European Low Voltage Directive. No exposed parts are at a dangerous voltage. Barber-Colman certifies that TE10A units have successfully passed Electromagnetic Compatibility (EMC) tests and enable the system which incorporates them to comply with the EMC Directive, when used in compliance with the Product User Manual. EMC filters are internal to the TE10A, external filters are needed for phase angle operation.

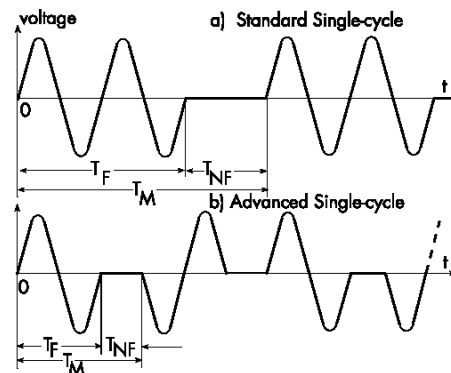
Firing modes—The TE10A is available in four firing modes:

Phase Angle Firing with optional current limit for use with inductive and temperature dependent loads.

Burst Firing and Single Cycle for use with infrared heaters as well as conventional resistive loads.

Advanced Single Cycle for use with short wave infrared heaters (low flicker).

Advanced Single Cycle operation reduces the flicker and brightness of short-wave infra-red heaters compared to standard Single Cycle. For outputs of less than 50%, the on periods are single cycles (16.67ms at 60 Hz).



Examples of firing in Single-cycle (a) and in advanced Single-cycle (b) modes at 66.6% of nominal power.

TECHNICAL SPECIFICATIONS

Power

Nominal current at 45°C	16, 25 or 50A (see current derating curve).
Nominal line-to-line voltage	100Vac to 500Vac +10%, -15% (for operating voltage, see product code).
Supply frequency	50 and 60Hz (±2Hz).
Load	Resistive or short-wave infrared elements - use TE10A Burst Firing, single cycle or advanced single cycle firing. Inductive, infrared or temperature dependent loads - use TE10A Phase Angle Firing.
Power terminal block	Cage terminals for 1.5 to 16 mm ² cables. Tightening torque 1.2Nm.
Safety ground	Screw terminal, same cable gauge as power. Tightening torque 2Nm.

Control Performance

Control type	The power controlled in the load is proportional to the setpoint.
Linearity	Better than ±2% of the full range.
Stability	Automatic compensation for supply variations from ±10% of the nominal voltage. Stability better than ± 2% of the full range with constant resistance.
Firing modes: Burst Firing Model	'Burst firing', 'Single cycle' or 'advanced Single cycle' At 50% power the SCR's are: On for 300ms and Off for 300ms (typical time) in 'Burst firing'. On for one cycle and Off for one cycle in 'Single cycle' and 'advanced Single cycle'. At 66.7% power the SCR's are: On for 400ms and Off for 200ms in 'Burst firing'. On for two cycles and Off for one cycle in 'Single cycle'. On for one cycle Off for half a cycle in 'advanced Single cycle'. SCR firing at zero voltage On indicated by a green LED
Phase Angle Model	Phase Angle firing varies the SCR conduction angle. Current limit is available as an option on this model.

Control

Input signal	Analog, DC voltage or current: 0 - 5V, 0 - 10V or 4 - 20mA. Voltage input impedance: 100kΩ, current input impedance: 250Ω.
Local control	10kΩ external potentiometer, a 5V user voltage is available.
Contacts	Contacts for On/Off logic operation.
Control terminals	Plug-in connector (0.5 to 1.5mm ² cables). Tightening torque 0.4Nm.

Option

Auxiliary power supply	Option for separate electronics power supply fed from 115Vac or 230Vac (when using non-standard mains supply).
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Approvals and European Directives

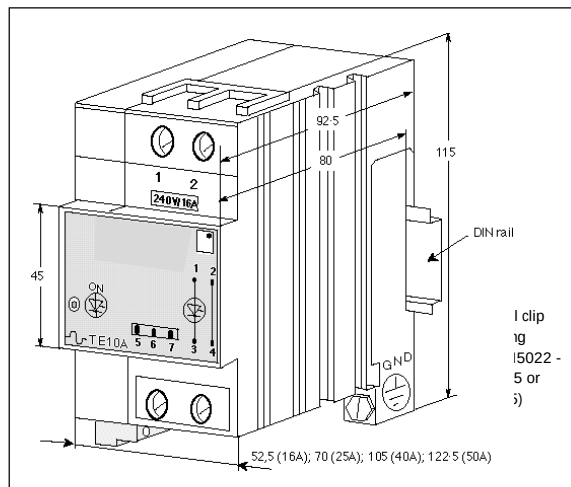
	UL / cUL listed.
CE marking / Electrical safety	TE10A products carry the CE mark in compliance with the European Low Voltage Directive. Complies with the Low Voltage Directive 73/23/EEC amended by the Directive 93/68/EEC (product installed and used in compliance with its user manual).
Electromagnetic compatibility	TE10A products comply with the Electromagnetic compatibility standards. Immunity—Generic standard EN 50082-2, Test standards EN 61000-4-2, EN 61000-4-4, ENV 50140, ENV 50141, ENV 50204. Emission—Generic standard EN 50081 -2, Test standard EN 55011 (with external filter for Phase Angle firing model, internal. EMC filter fitted on Burst Firing model) Product standard IEC 1800-3 A CE declaration of conformity is available on request.

Environment

Temperature	Operating: 0 to 45°C (up to 60°C with derating).
Storage:	-10 to +70°C.
Safety standards	EN61010, installation category 3 (voltage transients must not exceed 4.0KV).
Atmospheres	Electrically conductive pollution must be excluded from the cabinet in which this controller is mounted. This product is not suitable for use above 2000m or in corrosive or explosive atmospheres without further protection.
Humidity	Relative humidity: 5 to 95%, non-condensing and non-streaming.
SCR protection	High-speed external fuse (order separately). Internal MOV (varistor) and RC snubber.
Protection degree	IP20 (in accordance with IEC 529; 11.4, table 5). Isolation distances comply with IEC 664.
Isolation (1 minute test)	Between power and ground: 2000Vac. Between power and control inputs: 3600Vac.
Cooling	Natural convection.
Dimensions	Height : 4.5" (115mm) Depth : 3.6" (92.5mm) Width : TE10A/16A : 2.1" (52.5mm) TE10A/25A : 2.6" (70mm) TE10A/50A : 4.8" (122.5mm)
Weight	TE10A/16A : 1.2 lb. (550g) TE10A/25A : 1.5 lb. (700g) TE10A/50A : 2.6 lb. (1200g)

Mounting	Vertical on DIN rail (reference EN50022-35x7.5 or 35x15). Allow at least 0.4" (10mm) between units.
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Warranty: 2 years parts and labor (return to factory).



Basic product	Nominal current	Nominal voltage	Input	Firing	Option
TE10A					AX 144

Basic product	Code
TE10A	TE10A
Nominal current	
16 amps	16A
25 amps	25A
50 amps	50A

Example of product coding
 TE10A - 25A - 230V - 0V10 - FC - AX 144
 20A load used at 230Vac, firing in Burst mode,
 output of temperature controller 0 to 10V

Nominal voltage	
100 volts	100V
115 volts	115V
200 volts	200V
230 volts	230V
240 volts	240V
277 volts	277V
380 volts	380V
400 volts	400V
415 volts	415V
440 volts	440V
480 volts	480V
500 volts	500V

Input	
0-5Vdc	0V5
0-10Vdc	0V10
4-20mAdc	4mA20

Firing	
Burst firing	FC
Single cycle	FC1
Advanced single cycle	SCA
Phase angle	PA

Option	
Aux power supply	115 volts 115V
	230 volts 230V

Current limit (phase angle only)
 30% to 100% of nominal current

End Code	
Required	AX 144

Notes: For control by local potentiometer or by contacts, use the input product code 0V5.
 For non-standard line voltage, use the product code for the voltage immediately above and choose auxiliary power supply as an option.

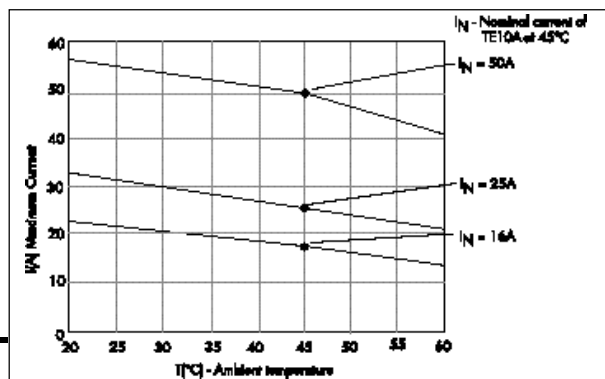
EXTERNAL HIGH SPEED FUSES AND FUSEHOLDER

Nominal current of TE10A	Fuse rating	Code for fuse and fuse holder	Fuse alone
16A	20A	FU1038 16A 00	CH260024
25A	32A	FU1038 25A 00	CH260034
50A	63A	FU2258/50A/00	CS173087U063

Remember!

The external high speed fuses recommended for the TE10A are used only for SCR protection and under no circumstances should they be used to protect the installations. These fuses are not suitable for use with short wave infrared elements.

CURRENT DERATING



Informações sobre programação
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